

What is claimed is:

1. An array antenna transmission and reception apparatus comprising:
a plurality of antenna elements;

a baseband processing section that carries out weighting processing corresponding to said respective antenna elements on transmission baseband signals to form transmission baseband signals with directivity and carries out weighting processing corresponding to said respective antenna elements on the reception baseband signals received from said plurality of antenna elements to form reception baseband signals with directivity;

a plurality of transmission radio sections provided between said baseband processing section and said plurality of antenna elements that convert said transmission baseband signals with directivity to radio signals;

a plurality of reception radio sections provided between said baseband processing section and said plurality of antenna elements that convert the radio signals received from said antenna elements to reception baseband signals;

a phase calibration transmission signal conversion section that converts said radio signals output from said plurality of transmission radio sections to reference baseband signals for phase calibration and inputs said reference baseband signals to said baseband processing section;

a phase calibration received signal conversion section that converts said radio signals received from said plurality of antenna elements to reference baseband signals for phase calibration and inputs said reference baseband signals to said baseband processing section;

a plurality of directivity couplers provided between said antenna elements and said transmission radio section and between said antenna elements said reception radio section;

a first selection section that selectively supplies one of said plurality of radio signals from said transmission radio section attenuated and output by said directivity couplers to said phase calibration transmission signal conversion section; and

a second selection section that selectively supplies one of said radio signals from said antenna elements attenuated and output by said directivity couplers to said phase calibration received signal conversion section.

2. The array antenna transmission and reception apparatus according to claim 1, wherein said directivity coupler comprises:

a first connection terminal connected to said antenna elements;
a second connection terminal connected to said transmission radio section and said reception radio section;
a third connection terminal with directivity toward said first connection terminal and connected to said phase calibration received signal conversion section; and
a fourth connection terminal with directivity toward said second connection terminal and connected to said phase calibration transmission signal conversion section.

3. The array antenna transmission and reception apparatus according to claim 2, further comprising:

a first switch between said phase calibration received signal conversion section and said third connection terminal that connects either said phase calibration received signal conversion section or termination to said third connection terminal; and

a second switch between said phase calibration transmission signal conversion section and said fourth connection terminal that connects one of said phase calibration transmission signal conversion section and termination to said fourth connection terminal.

4. The array antenna transmission and reception apparatus according to claim 2, further comprising:

a first band pass filter between said phase calibration received signal conversion section and said third connection terminal that selects said radio signals received by said antenna elements and allows said radio signals to pass; and

a second band pass filter between said phase calibration transmission signal conversion section and said fourth connection terminal that selects said radio signals output from said transmission radio section and allows said radio signals to pass.

5. The array antenna transmission and reception apparatus according to claims 2, further comprising an antenna duplexer connected to said transmission radio section, said reception radio section and said second connection terminal of said directivity coupler that outputs said radio signals output from said transmission radio section to said second connection terminal and outputs said radio signals output from said second connection terminal to said reception radio section.